

Amendments to the Claims:

This listing of claims will replace all prior versions of claims in the application:

Listing of Claims:

Claims 1-15 (Canceled).

16. (Currently Amended) A method of creating a composition of matter with one or more modified properties comprising:

selecting a metal compound comprising at least one metal and at least one element selected from the group consisting of: C, O, N, B, S, H, Se, Te, In, Sb, Al, Ni, F, P, Cl, Br, I, Si, and Ge;

adding at least one dopant element to the metal compound, wherein the at least one dopant element has a valency different than a valency of an electropositive element in the metal compound;

producing via high temperature processing a nanoscale powder form of a substance from the at least one dopant element and the metal compound, ~~thereby combining wherein the producing results in~~ the at least one dopant element ~~into being in~~ the lattice of the metal compound and wherein the producing results in a compound comprising three or more elements;

wherein combining the at least one dopant element into the lattice of the metal compound modifies at least one property of the metal compound; and

the nanoscale powder form of the substance is substantially compositionally uniform.

17. (Previously Presented) The method of claim 16 wherein the at least one metal in the metal compound is selected from the group consisting of Ti, Mn, Fe, Ni, Zn, Cu, Sr, Y, Zr, Ta, W, Sc, V, Co, In, Li, Hf, Nb, Mo, Sn, Sb, Al, Ce, Pr, Be, Np, Pa, Gd, Dy, Os, Pt, Pd, Ag, Eu, Er, Yb, Ba, Ga, Cs, Na, K, Mg, Pm, Pr, Ni, Bi, Tl, Ir, Rb, Ca, La, Ac, Re, Hg, Cd, As, Th, Nd, Tb, Md, and Au.

18. (Previously Presented) The method of claim 16 wherein the at least one dopant element is combined into the lattice in a concentration greater than 1% over the stoichiometric values.

19. (Previously Presented) The method of claim 16 wherein the property is selected from the group consisting of: electrical conductivity, dielectric constant, dielectric strength, dielectric loss, polarization, permittivity, critical current, superconductivity, piezoelectricity, mean free path, curie temperature, critical magnetic field, permeability, coercive force, magnetostriction, magnetoresistance, hall coefficient, BHmax, critical temperature, melting point, boiling point, sublimation point, phase transformation condition, vapor pressure, anisotropy, adhesion, density, hardness, ductility, elasticity, porosity, strength, toughness, surface roughness, coefficient of thermal expansion, thermal conductivity, specific heat, latent heat, refractive index, absorptivity, emissivity, dispersivity, scattering, polarization, acidity, basicity, reactivity, energy density, activation energy, free energy, entropy, frequency factor, bioactivity, biocompatibility, thermal coefficient of any property and pressure coefficient of any property.

20. (Previously Presented) The method of claim 16 wherein creating a composition of matter with one or more modified properties comprises one or more of steps selected from the group consisting of: heating in inert atmosphere, heating in oxidizing atmosphere and heating in reducing atmosphere.

21. (Previously Presented) The method of claim 16 wherein creating a composition of matter with one or more modified properties further modifies one or more of the following characteristics of the nanoscale powders: shape, surface area, morphology, surface characteristics, surface composition, size distribution and degree of agglomeration.

22. (Previously Presented) The method of claim 16 wherein creating a composition of matter with one or more modified properties comprises plasma processing.

23. (Previously Presented) The method of claim 16 wherein creating a composition of matter with one or more modified properties comprises a quench step.

24. (Previously Presented) The method of claim 16 wherein the at least one dopant element has a valency different than at least two metals in the metal compound.

25. (Previously Presented) The method of claim 16 wherein the nanoscale powder has an aspect ratio greater than 1.

26. (Currently Amended) A method of creating a composition of matter comprising:

selecting a metal compound comprising at least one metal and at least one element selected from the group consisting of: C, O, N, B, S, H, Se, Te, In, Sb, Al, Ni, F, P, Cl, Br, I, Si, and Ge;

adding at least one dopant element to the metal compound, wherein the at least one dopant element has a valency different than a valency of an electropositive element in the metal compound;

producing via high temperature processing a nanoscale powder form of a substance from the at least one dopant element and the metal compound, ~~thereby combining wherein the~~ producing results in the at least one dopant element ~~into~~ being in the lattice of the metal compound and wherein the producing results in a compound comprising three or more elements;

wherein combining the at least one dopant element into the lattice of the metal compound modifies at least one property of the metal compound; and

the nanoscale powder form of the substance exhibits a gradient composition.

27. (Previously Presented) The method of claim 26 wherein the at least one metal in the metal compound is selected from the group consisting of Ti, Mn, Fe, Ni, Zn, Cu, Sr, Y, Zr, Ta, W, Sc, V, Co, In, Li, Hf, Nb, Mo, Sn, Sb, Al, Ce, Pr, Be, Np, Pa, Gd, Dy, Os, Pt, Pd, Ag, Eu, Er, Yb, Ba, Ga, Cs, Na, K, Mg, Pm, Pr, Ni, Bi, Tl, Ir, Rb, Ca, La, Ac, Re, Hg, Cd, As, Th, Nd, Tb, Md, and Au.

28. (Previously Presented) The method of claim 26 wherein the at least one dopant element is combined into the lattice in a concentration greater than 1% over the stoichiometric values.

29. (Previously Presented) The method of claim 26 wherein the property is selected from the group consisting of: electrical conductivity, dielectric constant, dielectric

strength, dielectric loss, polarization, permittivity, critical current, superconductivity, piezoelectricity, mean free path, curie temperature, critical magnetic field, permeability, coercive force, magnetostriction, magnetoresistance, hall coefficient, BHmax, critical temperature, melting point, boiling point, sublimation point, phase transformation condition, vapor pressure, anisotropy, adhesion, density, hardness, ductility, elasticity, porosity, strength, toughness, surface roughness, coefficient of thermal expansion, thermal conductivity, specific heat, latent heat, refractive index, absorptivity, emissivity, dispersivity, scattering, polarization, acidity, basicity, reactivity, energy density, activation energy, free energy, entropy, frequency factor, bioactivity, biocompatibility, thermal coefficient of any property and pressure coefficient of any property.

30. (Previously Presented) The method of claim 26 wherein creating a composition of matter comprises one or more of steps selected from the group consisting of heating in inert atmosphere, heating in oxidizing atmosphere and heating in reducing atmosphere.

31. (Previously Presented) The method of claim 26 wherein creating a composition of matter comprises a combustion step.

32. (Previously Presented) The method of claim 26 wherein creating a composition of matter comprises plasma processing.

33. (Previously Presented) The method of claim 26 wherein creating a composition of matter comprises a quench step.

34. (Previously Presented) The method of claim 26 wherein the at least one dopant element has a valency different than at least two metals in the metal compound.

35 (Previously Presented) The method of claim 26 wherein the nanoscale powder has an aspect ratio greater than 1.

36. (Withdrawn) A product comprising the nanoscale powders prepared using the method of claim 16.

37. (Withdrawn) A product comprising the nanoscale powders prepared using the method of claim 26.

38. (Previously Presented) The method of claim 26 wherein the nanoscale powders are stoichiometric.

39. (Previously Presented) The method of claim 26 wherein the nanoscale powders are non-stoichiometric.

40. (Previously Presented) The method of claim 26 wherein creating a composition of matter further modifies one or more of the following characteristics of the nanoscale powders: shape, surface area, morphology, surface characteristics, surface composition, size distribution and degree of agglomeration.

41. (Withdrawn) A composition of matter comprising a nanoscale material wherein

the domain size of the material is less than 250 nanometers;

the composition of the material is non-stoichiometric;

the composition of the material is substantially uniform at the lattice level; and

the relative ratios of elements in the composition of the material differ by more than 1 % from stoichiometric values.

42. (Withdrawn) The composition of matter of claim 41 wherein the composition of the material comprises oxygen.

43. (Withdrawn) The composition of matter of claim 41 wherein the composition of the material comprises nitrogen.

44. (Withdrawn) The composition of matter of claim 41 wherein the composition of the material comprises boron.

45. (Withdrawn) The composition of matter of claim 41 wherein the composition of the material comprises carbon.

46. (Withdrawn) The composition of matter of claim 41 wherein the composition of the material comprises chalcogenides.

47. (Withdrawn) The composition of matter of claim 41 wherein the composition of the material comprises halide.

48. (Withdrawn) The composition of matter of claim 41 wherein the composition of the material comprises two or more metals.

49. (Withdrawn) A coating comprising the composition of matter of claim 41.

50. (Withdrawn) A product comprising the composition of matter of claim 41.

51. (Withdrawn) An ink comprising the composition of matter of claim 41.

52. (Withdrawn) The composition of matter of claim 41 wherein the domain size of the material is less than 100 nanometers.

53. (New) The method of claim 16 wherein creating a composition of matter comprises a combustion step.